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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/758,759	01/15/2004	Jonathan N. Payne	NSC1P292/P05784	6398
22434	7590	03/23/2006	EXAMINER	
BEYER WEAVER & THOMAS LLP			BLEVINS, JERRY M	
P.O. BOX 70250			ART UNIT	
OAKLAND, CA 94612-0250			PAPER NUMBER	
			2883	
DATE MAILED: 03/23/2006				

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/758,759

Applicant(s)

PAYNE, JONATHAN N.

Examiner

Jerry Martin Blevins

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 09 January 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 11/25/05, 1/11/06.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Response to Arguments*

Applicant's arguments filed January 9, 2006 have been fully considered but they are not persuasive.

Applicant argues that the lenses (Figure 10, element 6) taught in the applied prior art reference to Sugama et al., US Pre Grant Publication number 2002/0118907, are not positioned in the optical path of the ends of the plurality of core channels (3). However, examiner respectfully proposes that this argument is erroneous. Although the lenses of Sugama do not lie along a linear path relative to the ends of the core channels, they nevertheless are positioned in the optical path of said ends of the core channels. The optical path of the ends of the plurality of core channels is redirected by a mirror (5), which sends light from the core channels to the lenses. Optical path need not be linear.

Applicants also argue that Sugama fails to teach one or more channels with a curved section. However, in paragraph 172, Sugama teaches that the channels are bent, which implies some measure of curvature. The teaching that the bend is perpendicular should not be construed as to convey the total absence of curvature. On the contrary, any bending to the channels would necessitate some degree of curvature, despite a nearly perpendicular bend. Furthermore, even a perfectly perpendicular bend to the channels could reasonably be interpreted to yield a curved channel, since the bent channel would not be perfectly linear. (See page 8 of applicant's disclosure, where applicants teach a curved section following a turn of approximately 90 degrees).

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3, 5-12, 14-20, and 22-24 are rejected under 35 U.S.C. 102(b) as being anticipated by US Pre Grant Publication to Sugama et al., number 2002/0118907.

Regarding claim 1, Sugama teaches a waveguide system comprising a support substrate (Figures 16, element 21); a bottom cladding layer (22) formed on top of the support substrate; a plurality of core channels (23) suitable for optical transmission formed on top of the bottom cladding layer; a top cladding layer (27) formed on top of both the bottom cladding layer and the core channels such that the core channels are sandwiched between the bottom and the top cladding layer, the top cladding layer leaving an end of at least some of the core channels exposed to ambient air whereby light can enter and exit out of the ends of the core channels (paragraph 83, pages 5 and 6); and a plurality of lenses (Figure 12, elements 4) positioned in the optical path of the plurality of the core channels respectively (see response to arguments above), each of the plurality of optical lenses spaced from the ends of the core channels so that ambient air is provided between the ends of the core channels and the plurality of optical lenses respectively (Figures 10 and 12).

Regarding claim 2, Sugama teaches the limitations of the base claim 1. Sugama also teaches that the plurality of optical lenses are formed on the bottom cladding layer (Figure 12, element 2).

Regarding claim 18, Sugama teaches an apparatus, comprising: a light source (inherently present in the apparatus described below given that light is present to be transmitted, received, and detected), a multi-channel transmission waveguide coupled to receive light from the light source, the transmission waveguide producing a set of beams by guiding the light received from the light source so that the set of light beams emanate from the transmission waveguide in a first direction (Figures 11 and 16 and paragraph 59, page 4); a multi-channel reception waveguide spaced apart from the transmission waveguide in the first direction, the reception waveguide receiving the set of light beams emanating from the transmission waveguide (Figures 11 and 16 and paragraph 59, page 4); wherein the transmission and the reception waveguide are each formed of at least, a support substrate (Figures 16, element 21); a bottom cladding layer (21) formed on top of the support substrate; a plurality of core channels (23) suitable for optical transmission formed on top of the bottom cladding layer, each of the core channels having a first end and a second end; and a top cladding layer (27) formed on top of both the bottom cladding layer and the core channels such that the core channels are sandwiched between the bottom and the top cladding layer, the top cladding layer leaving the second end of at least some of the core channels exposed to ambient air whereby light can enter into or exit out of the second end of the core channels (paragraph 83, pages 5 and 6); a plurality of optical lenses (Figure 12,

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elements 4) positioned in the optical path of the plurality of the core channels respectively (see response to arguments above), each of the plurality of optical lenses spaced from the ends of the core channels so that ambient air is provided between the ends of the core channels and the plurality of optical lenses respectively (Figures 10 and 12); and a light detector (paragraph 295, page 14) optically coupled to the reception waveguide to receive light from the reception waveguide, the light detector including a plurality of light detecting elements that detect light intensity of the light from the reception waveguide (Figures 42D and 43C indicate a photodetector (83) for each of a multiple number of access holes).

Regarding claims 3 and 20, Sugama teaches the limitations of the base claims 1 and 18, respectively. Sugama also teaches that at least some of the core channels have a curved section wherein a lengthwise portion of a respective core channel follows a curved path (Figure 14), and where in the top cladding layer has at least one curve opening (16) that exposes the curved section of the core channel to the ambient air so that a radius of the curved section is smaller than when the top cladding layer covers the curved section (Figure 14).

Regarding claim 12, Sugama teaches a waveguide system comprising a support substrate (Figures 16, element 21); a bottom cladding layer (21) formed on top of the support substrate; a core channel (23) having a curved section which follows a curved path (Figure 14, see response to arguments above); and a selectively patterned top cladding layer (27) formed on top of both the bottom cladding layer and the core channels such that the core channel is sandwiched between the bottom and the top

cladding layer, wherein the top cladding layer is selectively patterned to have at least one curve opening (16) that exposes the curved section of the core channel to the ambient air so that a radius of the curved section is smaller than otherwise possible the top cladding layer covers the curved section (Figure 14).

Regarding claims 5 and 14, Sugama teaches the limitations of the base claims 3 and 12, respectively. Sugama also teaches that the curve opening exposes a curved section of more than one core channel (Figure 14).

Regarding claim 6, Sugama teaches the limitations of the base claim 3. Sugama also teaches that the shape of the curve opening conforms to the curved path of the curved section of a respective core channel (Figure 14).

Regarding claims 7, 15, and 22, Sugama teaches the limitations of the base claims 3, 12, and 20, respectively. Sugama also teaches that the curved path of the curved section of the core channel follows a turn of approximately 90 degrees or more (Figure 14).

Regarding claims 8, 16, and 23, Sugama teaches the limitations of the base claims 1, 12, and 18, respectively. Sugama also teaches that the top cladding layer has at least one access via (Figure 26, elements 34, 35) that exposes the core channel to the ambient air, whereby the access via provides access for optical communication with the exposed core channel.

Regarding claims 9, 17, and 24, Sugama teaches the limitations of the base claims 8, 16, and 23, respectively. Sugama also teaches an external optical device

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(lens 36, Figure 23) placed proximate to the access via (34) such that the external optical device is in optical communication with the exposed core channel.

Regarding claim 10, Sugama teaches the limitations of the base claim 8.

Sugama also teaches that the access via exposes a plurality of core channels to the ambient air, whereby the access via provides access for optical communication with the exposed core channels (Figure 26 teaches several exposed core channels).

Regarding claim 11, Sugama teaches the limitations of the base claim 1.

Sugama also teaches that the core channels are formed of a polymer material (page 12, paragraph 247).

Regarding claim 19, Sugama teaches the limitations of the base claim 18.

Sugama also teaches that the apparatus is an input device for an electronic device (wiring substrate, throughout), and wherein the input area is produced between the transmission waveguide and the reception waveguide (Figure 11).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 4, 13, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sugama in view of US Patent to Nakamura et al., number 5,604,835.



Regarding claims 4, 13, and 21, Sugama teaches the limitations of the base claims 3, 12, and 20, respectively. Sugama also teaches that the index of refraction of the core channels is greater than the index of refraction of the bottom cladding layer and of the ambient air (page 8, paragraph 156). Furthermore, Sugama teaches that the index of refraction of the core channels is at least 0.3 greater than the index of refraction of the ambient air (page 8, paragraph 156). Sugama does not teach that the index of refraction of the core channels is at least 0.3 greater than the index of refraction of the bottom cladding layer. Nakamura teaches a waveguide system (apparatus) wherein the index of refraction of the core material is at least 0.3 greater than the index of refraction of the cladding material (column 5, lines 11-15). Furthermore, Nakamura teaches a core material with index of refraction at least 0.3 greater than the index of refraction of the bottom cladding layer of Sugama (Nakamura, column 5, lines 11-15, Sugama, page 8, paragraph 156). It would have been obvious to one of ordinary skill in the art at the time of the invention to include the core material of Nakamura in the waveguide system (apparatus) of Sugama. The motivation would have been to improve the confinement of light in the core channels.

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within

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TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jerry Martin Blevins whose telephone number is 571-272-8581. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G. Font can be reached on 571-272-2415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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